TM 11-5826-200-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

RADIO RECEIVER R-746/AR

OPERATION AND ORGANIZATIONAL MAINTENANCE

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1959

TECHNICAL MANUAL

RADIO RECEIVER R-746/AR, OPERATION AND ORGANIZATIONAL MAINTENANCE

TM 11-5826-200-12
Changes No. 3

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *29 April 1960*

TM 11-5826-200-12, 19 February 1959, is changed as follows:

APPENDIX II
MAINTENANCE ALLOCATION
Superseded

Section I. INSTRUCTION

1. General

This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

a. Columns in the maintenance allocation chart are:

(1) *Part or component.* Only the nomenclature or standard item name is shown in this column. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations. The functions are:

(*a*) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute serviceable assemblies, sub-assemblies, and parts for unserviceable components.

(*f*) *Repair.* To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Rebuild.* To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The X indicates the echelon responsible for performing that particular maintenance operation, but does not

*These changes supersede C 2, 11 December 1959.

necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment listed in section III. The grouping of codes in this column indicate the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data in the preceding columns.

b. Columns in the allocation of tools for maintenance functions are:

(1) *Tools required for maintenance* functions. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* A dagger (†) indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by Signal service organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

4. Comments or Suggestions

Any comments concerning omissions and discrepancies in this manual will be prepared on DA Form 2028 and forwarded direct to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., ATTN: SIGFM/ES-M.

Section II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
RECEIVER, RADIO R-746/AR	service		X					
				X			5	
	adjust	X						Operating controls
				X			2,5,8	
	inspect		X					
				X			5	
	test			X			1,2,3,5,6,8	Use code 8 for Flight line checks
						X	1,2,4,5,6,7,8	
	replace		X					
	repair			X			5	
	align			X			1,2,5,6,8	
	rebuild					X	5	
ANTENNA (Bendix No. MN-92A	service		X					
	inspect		X					
	replace		X				5	
	repair			X			5	
ANTENNA SUBASSEMBLY	rebuild				X			
BRACKET, ANGLE	replace			X				
CONNECTOR, RECEPTACLE, ELECTRICAL	replace			X				
INSERT, SCREW THREAD	replace			X				
PLATE, CAPACITOR	replace			X				
SCREW, ADJUSTING	replace			X				
SUPPORT, ANTENNA	replace			X				
CAPACITOR, FIXED	replace			X				
CAPACITOR, VARIABLE	replace			X				
COIL, RADIO FREQUENCY	replace			X				
CONNECTOR	replace			X				
CONTROL, RECEIVER C-2065/AR	service		X					
	inspect		X					
	replace		X				5	
	repair			X			5	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH	(4) 2ND ECH	(5) 3RD ECH	(6) 4TH ECH	(7) 5TH ECH	(8) TOOLS REQUIRED	(9) REMARKS
R-746/AR (continued)								
DIAL, CONTROL	replace			X				
KNOB	replace		X					
LAMP, INCANDESCENT	replace		X					
LIGHT, PANEL	replace			X				
PACKING, PREFORMED	replace			X				
PANEL, LIGHT DIRECTING	replace			X				
PRISM	replace		X					
RESISTOR, FIXED	replace			X				
RESISTOR, VARIABLE	replace			X				
SWITCH, ROTARY	replace			X				
SWITCH, SECTION, ROTARY	rebuild				X			
COVER	replace			X				Fabricate at 5th echelon
CRYSTAL UNIT, QUARTZ	replace			X				
ELECTRON TUBE	replace			X				
FILTERS, PAIRED	replace			X				
IMPEDANCE, DECOUPLING	replace			X				
JACK, TELEPHONE	replace		X					
MOUNTING MT-1762/AR	service		X					
	inspect		X					
	replace		X				5	
	repair			X			5	
CONNECTOR, RECEPTACLE								
MOUNT, SHOCK	replace			X				
PAD, SHOCK MOUNT	replace			X				
RING, RETAINING	replace			X				
THUMBSCREW	replace			X				
REACTOR	replace			X				
RELAY, ARMATURE	replace			X				
RESISTOR, FIXED	replace			X				
RESISTOR, THERMAL	replace			X				
RESISTOR, VARIABLE	replace			X				
SEMI-CONDUCTOR DEVICE SET	replace			X				
SHIELD, ELECTRON TUBE	replace			X				
SOCKET, ELECTRON TUBE	replace			X				
STUD	replace			X				
TERMINAL BOARD ASSEMBLY	replace					X		Fabricate
TRANSFORMER	replace			X				

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH.	(3) 2ND ECH.	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
R-746/AR (continued)							
MULTIMETER AN/URM-105			†	†	†	1	
SIGNAL GENERATOR AN/GRM-4			†	†	†	2	
TEST SET, ELECTRON TUBE TV-7/U			†	†		3	
TEST SET, ELECTRON TV-2/U					†	4	
TOOL EQUIPMENT TE-113			†	†	†	5	
MAINTENANCE KIT, ELECTRONIC EQUIPMENT MK-926/AC			†	†	†	6	
ELECTRONIC MULTIMETER ME-30/U			†	†	†	7	
SIGNAL GENERATOR SG-13/ARN			†			8	

[AG 413.44 (18 Mar 60)]

By Order of *Wilber M. Brucker,* Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General United States Army,
The Adjutant General.

Distribution:

Active Army:

USASA (2)
Def Atomic Spt Agcy (5)
CNGB (1)
Technical Stf, DA (1) except
  CSigO (18)
USARADCOM (2)
USCONARC (5)
MDW (1)
Armies (5) except
  First US Army (7)
USARADCOM Rgn (2)
OS Maj Comd (5)
Base Comd (5)
Log Comd (5)
Corps (2)
USA Corps (Res) (1)
Trans Terminal Comd (1)
WRAMC (1)
AFIP (1)
AMS (1)
Army Terminals (1)
Gen Depots (2) except
  Atlanta GENDEP (none)
OS Sup Agcy (1)
Ports of Emb (OS) (2)
Tech Staf Bd (1)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA Air Def Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USAATB (1)
Ft Belvoir (5)
Svc Colleges (5)
Br Svc Sch (2) except
  USASCS (25)
USATC (2)
Sig Sec, Gen Depot (10)
Sig Depots (17)
Army Pictorial Cen (2)
Engr Maint Cen (1)
USA Ord Msl Comd (3)
USASSA (15)
USASSAMRO (1)
USA Sig Pub Agcy (8)
USA Sig Engr Agcy (1)
USA Comm Agcy (3)
USA Sig Equip Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
Yuma Test Sta (2)
Sig Fld Maint Shops (3)
Sig Lab (5)
USA Elct PG (1)
Div (2)
JBUSMC (2)

Units org under fol TOE:

11-7 (2)
11-16 (2)
11-57 (2)
11-98 (2)
11-117 (2)
11-155 (2)
11-500 (AA-AE) (2)
11-557 (2)
11-587 (2)
11-592 (2)
11-597 (2)

NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1960—520799/1973

TECHNICAL MANUAL

RADIO RECEIVER R–746/AR, OPERATION AND ORGANIZATIONAL MAINTENANCE

TM 11–5826–200–12
CHANGES NO. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *11 December 1959*

TM 11–5826–200–12, 19 February 1959, is changed as follows:

Page 13. Delete appendix II and substitute the following:

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

a. Columns in the maintenance allocation chart are—

(1) *Part or component.* Only the nomenclature or standard item name is shown in this column

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operation. The functions are as follows:

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(g) Aline. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) Rebuild. To restore to a condition comparable to new by disassembling the item to determine the condition of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, subassemblies, and parts.

(3) *1st, 2d, 3d, 4th, and 5th echelons.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment listed in section III. The grouping of codes in this column indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follow:

(1) *Tools required for maintenance functions.* This column lists the tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, and 5th echelons.* A dagger (†) indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquar-

ters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the Maintenance Allocation Chart do not include mounting hardware such as: screws, nuts, bolts, washers, brackets, and clamps, etc.

4. Comments or Suggestions

Any comments concerning omissions and discrepancies in this manual will be prepared on DA Form 2028 and forwarded directly to Commanding Officer, U. S. Army Signal Equipment Support Agency, Fort Monmouth, N. J., ATTN: SIGFM/ES-M.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
RECEIVER, RADIO R-746/AR	service		X					
	adjust	X		X			5	Operating controls
	inspect		X	X			2,5,8	
	test			X			5	
	repair			X		X	1,2,3,5,6,8	Use code 8 for Flight line checks
	align			X			1,2,4,5,6,7,8	
	rebuild			X		X	5	
ANTENNA (Bendix No. MN-92A	service		X					
	inspect		X					
	replace			X			5	
	repair			X			5	
CAPACITOR, FIXED	replace			X				
CAPACITOR, VARIABLE	replace			X				
COIL, RADIO FREQUENCY	replace			X				
CONNECTOR	replace			X				
CONTROL, RECEIVER C-2065/AR	service		X					
	inspect		X					
	replace			X			5	
	repair			X			5	

(1) PART OR COMPONENT	(2) MAINTENANCE FUNCTION	(3) 1ST ECH.	(4) 2ND ECH.	(5) 3RD ECH.	(6) 4TH ECH.	(7) 5TH ECH.	(8) TOOLS REQUIRED	(9) REMARKS
R-746/AR (continued)								
COVER	replace			X				Fabricate at 5th echelon
CRYSTAL UNIT, QUARTZ	replace			X				
ELECTRON TUBE	replace			X				
FILTERS, PAIRED	replace			X				
IMPEDANCE, DECOUPLING	replace			X				
JACK, TELEPHONE	replace			X				
MOUNTING MT-1762/AR	service		X					
	inspect		X					
	replace			X			5	
	repair			X			5	
REACTOR	replace			X				
RELAY, ARMATURE	replace			X				
RESISTOR, FIXED	replace			X				
RESISTOR, THERMAL	replace			X				
RESISTOR, VARIABLE	replace			X				
SEMI-CONDUCTOR DEVICE SET	replace			X				
SHIELD, ELECTRON TUBE	replace			X				
SOCKET, ELECTRON TUBE	replace			X				
STUD	replace			X				
TERMINAL BOARD ASSEMBLY	replace			X				
TRANSFORMER	replace					X		Fabricate

SECTION III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

(1) TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	(2) 1ST ECH.	(3) 2ND ECH.	(4) 3RD ECH.	(5) 4TH ECH.	(6) 5TH ECH.	(7) TOOL CODE	(8) REMARKS
R-746/AR (continued)							
MULTIMETER AN/URM-105			†	†	†	1	
SIGNAL GENERATOR AN/GRM-4			†	†	†	2	
TEST SET, ELECTRON TUBE TV-7/U			†	†		3	
TEST SET, ELECTRON TV-2/U					†	4	
TOOL EQUIPMENT TE-113			†	†	†	5	
MAINTENANCE KIT, ELECTRONIC EQUIPMENT MK-928/AC			†	†	†	6	
ELECTRONIC MULTIMETER ME-30/U			†	†	†	7	
SIGNAL GENERATOR SG-13/ARN			†			8	

[AG 413.44 (17 November 1959)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

USASA (1)
CNGB (1)
Tech Stf, DA (1) except
CSigO (19)
Tech Stf Bd (1)
USCONARC (5)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA Air Def Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USATB (1)
US ARADCOM (Incl ea Rgn) (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5) except First
US Army (7)
Corps (2)
Div (2)
USATC (2)
Yuma Test Sta (2)
USA Elct Pg (1)
Svc Colleges (5)
Gen Depot (2)
Sig Sec, Gen Dep (12)
Sig Dep (19)
AFIP (1)
WRAMC (1)
USAMS (1)
Engr Maint Cen (1)
USA Comm Agcy (2)
USA Sig Engr Agcy (1)
USA Publ Agcy (8)
USA Sig Eqp Spt Agcy (7)
USA Sig Msl Spt Agcy (13)
Trans Terminal Comd (1)
Army Terminals (1)
Port of Emb (OS) (2)
OS Sup Agcy (1)
Sig Fld Maint Shops (3
Sig Lab (5)
USASSA (Phila, Pa) (15)
Mid Western Rgn (USASSA) (1)
USA Corps (Res) (1)
Def Atomic Spt Agcy (5)
Army Pictorial Cen (2)
USA Ord Msl Comd (3)
JBUSMC (2)

Two copies to each unit org under the fol TOE:

11-7
11-16
11-57
11-98
11-117
11-155
11-500, AA-AE
11-557
11-587
11-592
11-597

NG: State AG (3) units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320-50.

☆U. S. GOVERNMENT PRINTING OFFICE: 1959—520794/1125

TECHNICAL MANUAL

RADIO RECEIVER R-746/AR OPERATION AND ORGANIZATIONAL MAINTENANCE

TM 11-5826-200-12
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *25 August 1959*

TM 11-5826-200-12, 19 February 1959, is changed as follows:

Page 3, paragraph 3*a*, line 6. Change "(fig. 5) to: (fig. 4).

Page 4, paragraph 5, chart. Add after last item:

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Glide Path Antenna (commercial nomenclature MN-92A or MN-92B).	5 1/16	2 1/4	6	1 1/2

Paragraph 6, chart. Add after last item:

Nomenclature	Common name
Glide Path Antenna MN-92A or MN-92B	Antenna.

Page 5. Add paragraph 8.1 after paragraph 8.

8.1. Description of Glide Path Antennas MN-92A and MN-92B (fig. 3.1)

Antenna MN-92A or MN-92B functions as the receiving antenna for Radio Receiver R-746/AR. The physical structure of the antenna is such that it may be mounted flush with the skin of the aircraft, using a plexiglass cover over the opening. Normally, the antenna will be mounted in the nose of the ship facing forward. The angle is not critical although the perpendicular plane of the antenna should not be more than +15° or −20° from the horizontal axis of the aircraft. The MN-92A is supplied with a 90° coaxial fitting on the side of the housing, and the MN-92B is provided with a straight fitting. The antenna assembly comprises four paralleled conductors (rods) mounted in a brass housing or cavity. The four rods act as an antenna array, which picks up the signal from the electric field set up within the box by the oncoming radio wave. Each of the rods are supported at one end by a micarta insulator. The insulator is fastened to one side of the box. The other end of each rod is fastened to a common conductor of the coaxial fitting. The conductors are fashioned from ⅛-inch brass tubing and the entire assembly is silver-plated.

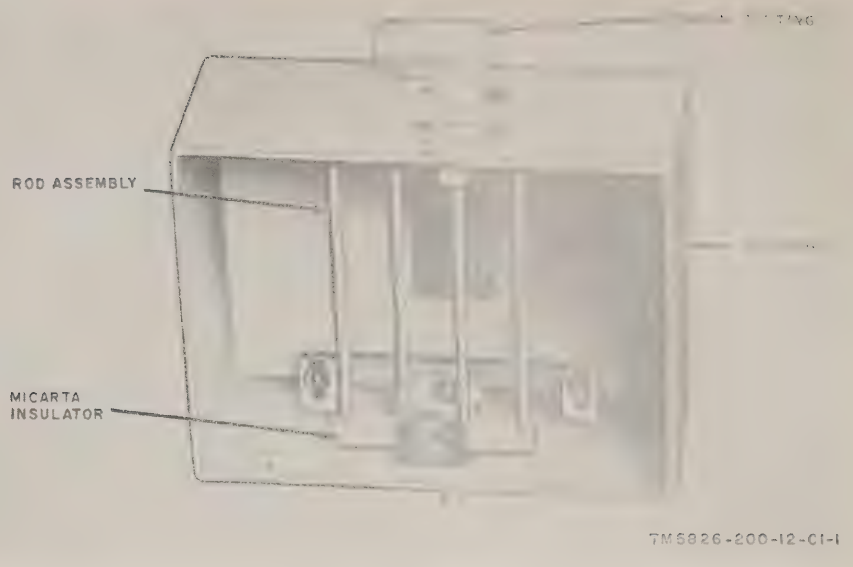


Figure 3.1. (Added) *Glide path antenna MX–992A.*

[AG 413.44 (11 Aug 59)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

L. L. LEMNITZER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

ASA (2)
CNGB (1)
Tech Stf, DA (1) except CSigO (18)
Tech Stf Bd (1)
USCONARC (5)
USA Arty Bd (1)
USA Armor Bd (1)
USA Armor Bd Test Sec (1)
USA Inf Bd (1)
USA Air Def Bd (1)
USA Air Def Bd Test Sec (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA Arctic Test Bd (1)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
OS Base Comd (5)
Log Comd (5)
MDW (1)
Armies (5) except First US Army (7)
Corps (2)
Div (2)
USATC (2)
Def Atomic Spt Agcy (5)
Yuma Test Sta (2)
USA Elct PG (1)
Svc Colleges (5)
Br Svc Sch (5) except USASCS (25)
Gen Depots (2) except Atlanta Gen Depot (none)
Sig Sec, Gen Depot (10)
Sig Depots (17)
AFIP (1)
WRAMC (1)
AMS (1)
Engr Maint Cen (1)
USA Comm Agcy (2)
USA Sig Engr Agcy (1)
USA Sig Pubs Agcy (8)
USA Sig Eqp Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
Trans Terminal Comd (1)
Army Terminals (1)
Port of Emb (OS) (2)
OS Sup Agcy (1)
Sig Fld Maint Shops (3)
Sig Lab (5)
Mil Dist (1)
USA Corps (Res) (1)
Sectors, USA Corps (Res) (1)
JBUSMC (2)
Army Pictorial Cen (2)
USA Ord Msl Comd (3)
Units organized under following TOE's:
11–7 (2)
11–16 (2)
11–57 (2)
11–98 (2)
11–117 (2)
11–155 (2)
11–500 (AA–AE) (2)
11–557 (2)
11–587 (2)
11–592 (2)
11–597 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1959

TECHNICAL MANUAL
No. 11-5826-200-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *19 February 1959*

RADIO RECEIVER R-746/AR

OPERATION AND ORGANIZATIONAL MAINTENANCE

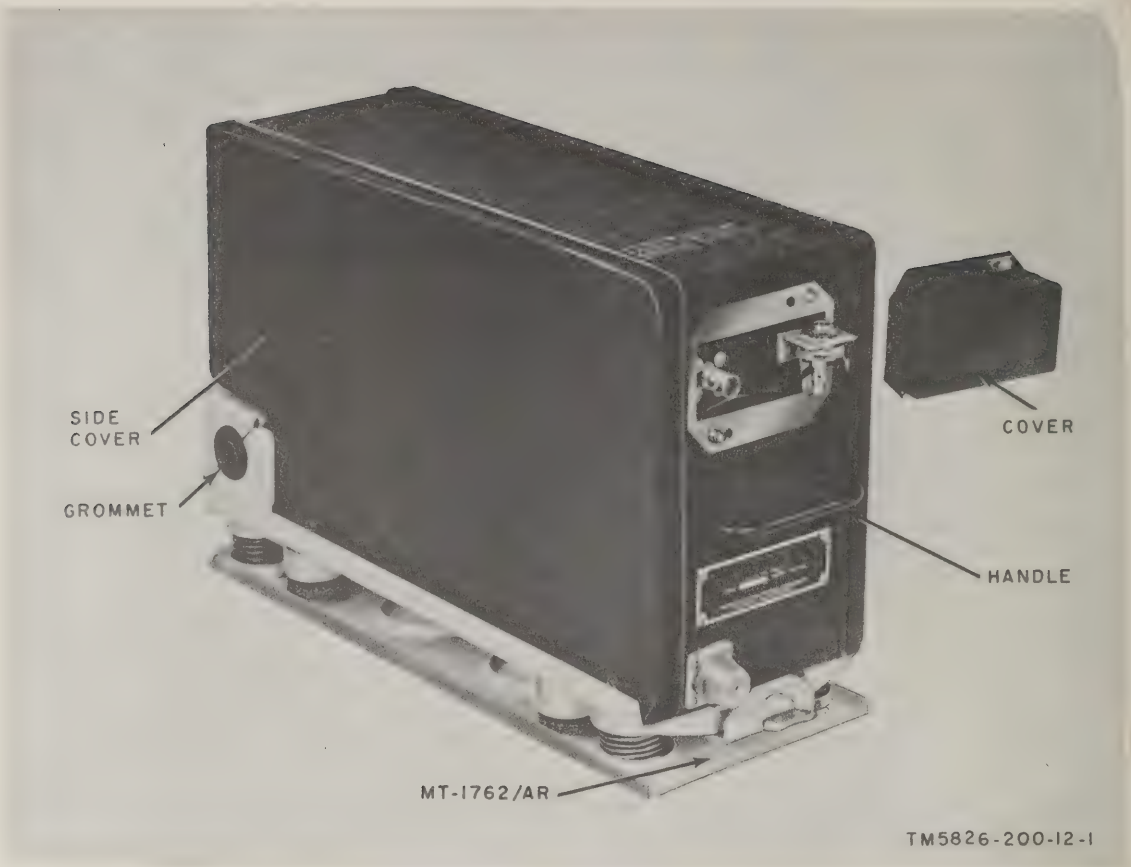


Figure 1. Radio Receiver R-746/AR, installed in Mounting MT-1762/AR.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describes Radio Receiver R–746/AR and covers its operation and operator's organizational maintenance.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report), to the Commanding Officer, U.S. Army Signal Equipment Support Agency. Fort Monmouth, N.J., as prescribed in AR 700–38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment), as prescribed in AR 700–58.

d. Parts List Form. Forward DA Form 2028, (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8 and 9), directly to the Commanding Officer, U.S. Army Signal Equipment Support Agency, Fort Monmouth, N.J. ATTN: SIGFM/ES–M, with comments on parts listings.

e. Comments on Manual. Forward all other comments on this publication directly to the Commanding Officer, U.S. Army Signal Publications Agency, Fort Monmouth, N.J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Radio Receiver R–746/AR is a lightweight airborne superheterodyne receiver. It is designed to receive glide-slope information to produce vertical guidance during aircraft landing operations when used with Indicator ID–48/ARN or Course Indicator ID–249A/ARN (fig. 5). Radio Receiver R–746/AR is capable of receiving any one of 20 carrier frequencies with 300-kilocycle (kc) separation between 329.3 and 335.0-megacycles (mc).

b. Radio Receiver R–746/AR is a part of the instrument landing system (ILS) which provides for both vertical and lateral guidance when landing an aircraft. Lateral guidance is supplied by a separate receiver (Radio Receiving Set AN/ARN–30TM11–520). The signals received by Radio Receiver R–746/AR are radiated by an ultra-high frequency (uhf) glide-slope transmitter located close to the touchdown point on the airfield landing strip or runway. These signals are used to operate the horizontal pointer of one to three Indicators ID–48/ARN to provide a continuous visual indication of the position of the aircraft with respect to the established glide slope. The glide-slope path (fig. 2) is an rf beam created by the combined operation of the vertical and lateral guidance transmitter, which radiates an rf beam at a specified angle from the landing spot on the field. The instrument approach system includes a glide-slope transmitter which transmits a carrier frequency into the desired field pattern. In this pattern, a 150-cycle tone-modulated carrier frequency is radiated in the area below the plane of the glide slope, and a 90-cycle tone-modulated carrier of the same frequency is radiated in the area above the glide slope. When the aircraft is approaching an airfield, Radio Receiver R–746/AR is tuned to the channel (carrier frequency) of the glide-slope transmitter in use. The 90- and 150-cycle tone signals are changed to direct current (dc) voltages which represent the position of the aircraft with respect to the glide-slope path. These voltages cause the indi-

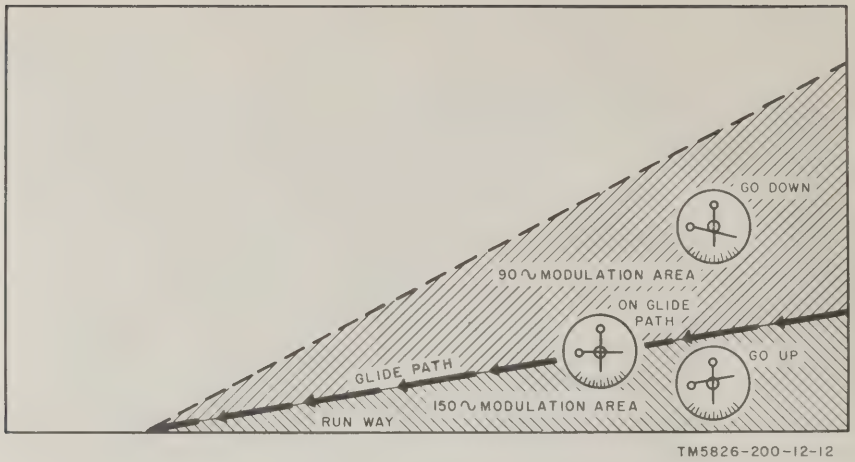


Figure 2. Glide-slope path chart.

cators to show whether the aircraft is above, below, or on the glide-slope path.

c. Radio Receiver R–746/AR is shipped with a set of 20 crystals installed, which can be connected in sequence to the oscillator circuit by relays. These crystal-selector relays are wired to pins on the main connector at the rear of Radio Receiver R–746/AR so that the relays may be remotely operated from Receiver Control C–2065/AR (fig. 5). A power supply included on the chassis of Radio Receiver R–746/AR operates from the 115-volt alternating current (ac) voltage in the aircraft.

4. Technical Characteristics

Frequency range	329.3 to 335.0 mc.
Number of channels	20.
Channel spacing	300 kc.
Type of modulation	Amplitude.
Type of receiver	Single-conversion superheterodyne.
Intermediate frequency	18.9 mc.
RF input	52-ohm coaxial (UG–58/U).
Power requirements:	
Plate supply	115 volts ac, 320 to 1,000 cycles, .25 amperes.
Filament and relay coils	26.5 volts dc, 1.1-amperes negative grounded.
Selectivity	135 kc, 6 db down; 600 kc, 75 db down.
Frequency stability	±.02% for total variation from 55° C to 70° C.
Undesired response rejections:	
Adjacent channel	70 db or more.
Image	75 db or more.
IF	90 db or more.
Others	70 db or more.
Radiation	Negligible; simultaneous operation of two receivers on a common antenna is satisfactory.
Sensitivity	30-microvolt input will produce at least 69-microampere deflection current.
Harmonic distortion	Less than 5%.
Intermodulation	Less than 10%.
Number of tubes	16.
Weight	12.8 pounds.

5. Components of Radio Receiver R–746/AR

The components of Radio Receiver R–746/AR are listed in the following table:

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Radio Receiver R–746/AR including:	7⅝	14⅛	4⅞	13.0
1	Mounting MT–1762/AR.	3¾	13 3/32	5 5/16	1.9

6. Nomenclature and Common Names

A list of the nomenclature assignments for the components of Radio Receiver R–746/AR and associated equipment is given below. A common name is indicated after each item.

Nomenclature	Common name
Radio Receiver R–746/AR	Receiver.
Mounting MT–1762/AR	Mounting.
Receiver Control C–2065/AR	Control panel.
Course Indicator ID–249A/ARN.	Course indicator.
Indicator ID–48/ARN	Cross-pointer indicator.

7. Description of Radio Receiver R–746/AR
(fig. 1)

a. Radio Receiver R–746/AR is a high-performance, compact, rugged receiver designed for aircraft use. The receiver consists of a main chassis and also a removable subchassis with 20 crystals and associated relays. The receiver features wrap-around case type construction with removable side covers. The entire case is dustproof, sprayproofed, and dripproof. All parts are included within the wrap-around case except connections and test jacks which extend through a cutout in the wrap-around housing. The connections and test jacks are protected by a removable cover secured by two slide fasteners. The case is completed by two side covers which are hooked in place on the top edge and latched in place with locking fasteners (screw-driver operated) on the lower edge.

b. A handle on the front panel facilitates removal of the receiver from the mounting. The tubes and the top of the chassis within the case can be reached by removing a side cover. The wiring and the bottom of the chassis can be reached by removing the other side cover.

8. Description of Mounting MT–1762/AR
(fig. 3)

a. Mounting MT–1762/AR, fabricated from sheet aluminum, consists of a flat plate with side edges bent upward at a right angle to form a channel for the receiver chassis. A vibration isolator and a damper are provided at each corner of the mounting, and the assembly is fastened down to the supporting shelf by four screws through the base plate. Two corner plates and a transverse rear plate and a cover provide a housing for the cable assembly used for connection to the receiver.

b. At the front of the mounting is a locking device which holds the receiver in place.

9. Additional Equipment Required

The following equipment is not supplied as part of Radio Receiver R–746/AR but is needed for use with the receiver. This equipment is normally present in the aircraft as part of Radio Receiving Set AN/ARN–30. For additional information, refer to TM 11–520.

a. Receiver Control C–2065/AR. All controls

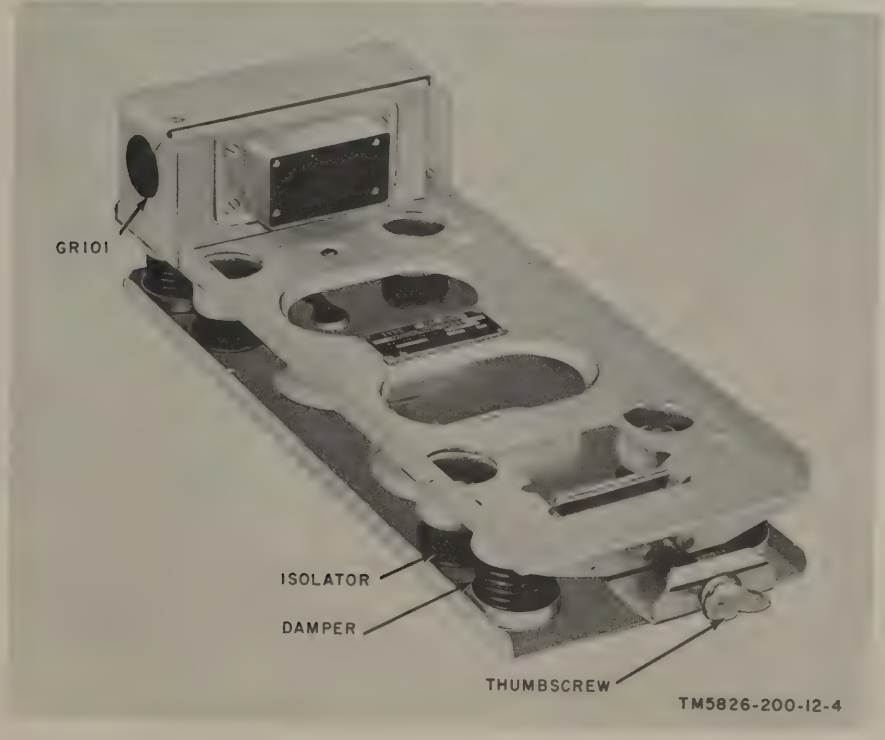


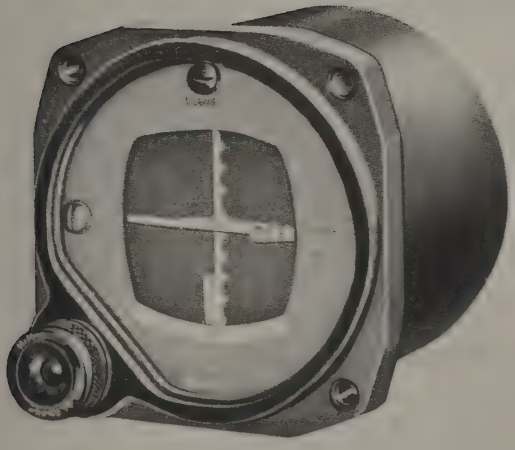
Figure 3. Vibration Mounting MT–1762/AR, front oblique view

necessary for the operation of the glide-slope and lateral receivers are mounted on the control panel (fig. 4). The control panel provides remote control of Radio Receiving Set AN/ARN–30 and remote tuning control of Radio Receiver R–746/AR. Power is controlled by on-off rotary switch combined with a variable resistor which is used for controlling the volume level of the received signal.

b. Indicators. Two types of indicators (fig. 4) can be used with the receiver to provide visual indications of the guidance information: either Course Indicator ID–249A/ARN or Indicator ID–48/ARN indicators (fig. 4). Radio Receiver R–746/AR provides a signal source for the glide-slope pointer and the associated flag alarm circuits which are a part of both types of pointers.

RECEIVER CONTROL C-2065/AR

COURSE INDICATOR ID-249A/ARN



INDICATOR ID-48/ARN

TM5826-200-12-7

Figure 4. Receiver Control C-2065/AR and Course Indicator ID-249A/ARN and Indicator ID-48/ARN.

CHAPTER 2

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

10. General

All controls necessary for normal operation are located on Receiver Control C–2065/AR (par. 11).

11. Receiver Control C–2065/AR

(fig. 4)

The visual indications of the indicators are essential for the proper use and operation of the equipment. The glide-slope path (fig. 2) illustrates the horizontal needle positions of the indicators and the significance of these positions to the pilot. The course of the aircraft should follow the direction indicated by the needle. The following table lists the operating controls and their functions:

Control	Function
VOL	Combination on-off and volume control. Controls application of power to Radio Receiving Set AN/ARN–30; when rotated clockwise, turns power on. Further clockwise rotation increases the audio level of Radio Receiver R–746/AR.
Frequency selection knobs.	Selects desired frequency or channel. Concentric knob type frequency selector calibrated directly in frequency. The glide-slope receiving channel is set up automatically when the corresponding localizer channel frequency is selected.

Section II. PILOT'S PRE-FLIGHT AND OPERATING INSTRUCTIONS

Note. If an abnormal indication is obtained during the pre-flight and operating procedures, do not attempt to make any adjustment of the receiver controls. These adjustments are critical and must be made by trained maintenance personnel with adequate test equipment. Report the failure.

12. Operating Procedure

The pilot's pre-flight check consists of applying power to the aircraft radio set and checking the indicators for normal output indications. The sequence of operation prior to take-off is listed below. Perform the operations in the order given.

a. Turn the VOL control clockwise to apply power to the aircraft Radio Receiving Set AN/ARN–30.

b. Continue to turn volume control clockwise until an increase in the audio level of the glide-slope receiver is noted.

Note. The horizontal needle on each indicator is actuated by the glide-slope receiver and provides vertical guidance during landing operations. The vertical needle on each indicator is actuated by Radio Receiver R–445/ARN–30 (which is a component of Radio Receiving Set AN/ARN–30) for lateral guidance during aircraft instrument landing operations.

13. Channel Changing

The receiver is controlled by Receiver Control C–2065/AR and produces indications on the indicators. The dial of the control panel (fig. 5) is calibrated in localizer frequency channels (TM 11—520). The selector switch located on the

control panel is used to select the desired operating frequency. Comparative switch positions versus localizer frequencies are listed below.

Switch position (or channel No.)	Localizer frequency (mc)	Switch position (or channel No.)	Localizer frequency (mc)
1	108. 4	11	109. 4
2	108. 5	12	109. 5
3	108. 6	13	109. 6
4	108. 7	14	109. 7
5	108. 8	15	109. 8
6	108. 9	16	109. 9
7	109. 0	17	110. 0
8	109. 1	18	108. 1
9	109. 2	19	108. 2
10	109. 3	20	108. 3

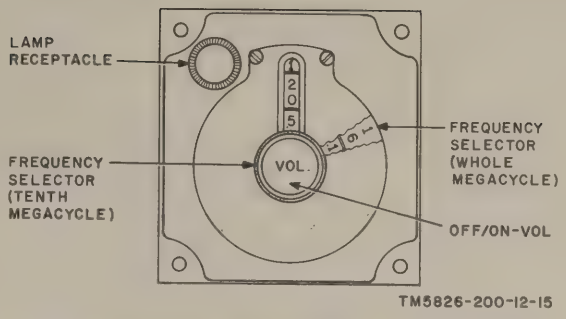


Figure 5. Receiver Control C–2065/AR, operating controls.

14. Stopping Procedure

To turn off the equipment, turn the VOL control extremely counterclockwise. A pronounced click should be heard as the extreme counterclockwise position is reached.

CHAPTER 3

ORGANIZATIONAL MAINTENANCE

15. Scope of Organizational Maintenance

Organizational maintenance of Radio Receiver R–746/AR consists of performing preventive maintenance (par. 16). The pilot does no preventive maintenance or trouble shooting on the equipment.

16. Preventive Maintenance

Preventive maintenance will be performed by the crew chief. Trouble shooting and repair will be done at higher echelon. The following operations will be performed by the crew chief in the order given.

a. Check for completeness and general condition of Radio Receiver R–746/AR, Mounting MT–1762/AR, cables, and cable connections.

b. Clean dirt and moisture from the equipment. Particularly the cable connectors and component panels.

c. Tighten the thumbscrew on the mounting base. Tighten by hand. Use no tools.

d. Remove rust from components and touch up bare spots with paint.

e. Carefully check antenna lead-in cable, connecting cable (between the control panel and the receiver), and shock mount for cuts, kinks, breaks, fraying, and undue strain. Repair any cuts in the insulation by covering them with rubber tape and then with friction tape. Replace or repair all broken cords and cables.

f. Inspect accessible items for looseness: Jacks, connectors, etc.

CHAPTER 4

DEMOLITION TO PREVENT ENEMY USE

17. Authority for Demolition

Demolition of the equipment will be accomplished only upon the order of the commander. The destruction procedures outlined in paragraph 18 will be used to prevent further use of the equipment.

18. Method of Destruction

Use any of the following methods to destroy the equipment:

a. Smash. Smash the control panel, tubes, coils, capacitors, transformers, and indicators; use sledges, axes, handaxes, pickaxes, hammers, or crowbars.

b. Cut. Cut all cables.

c. Burn. Burn cables and technical manuals; use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

d. Bend. Bend side panels and the case.

e. Explode. If explosives are necessary, use firearms, grenades, or TNT.

f. Dispose. Bury or scatter the destroyed parts in slit trenches, fox holes, or throw them into streams.

APPENDIX I

REFERENCES

Following is a list of references applicable and available to the unit repairman of Radio Receiver R–746/AR:

TM 11–520, Radio Receiving Set AN/ARN–30, Operation and Maintenance.

TM 11–520A, Radio Receiving Set AN/ARN–30A, Operation and Service Instructions.

APPENDIX II

MAINTENANCE ALLOCATION

1. General

Maintenance allocation assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

2. Columns in Maintenance Allocation Chart

a. Part or component. This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and sub-assemblies appear in alphabetical order with their components listed alphabetically immediately below the assembly listing.

b. Maintenance function. This column indicates the various maintenance functions allocated to the echelon capable of performing the operation. These are defined as follows:

(1) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(2) *Adjust.* To regulate periodically to prevent malfunction.

(3) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(4) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(5) *Replace.* To substitute serviceable assemblies, sub-assemblies, and parts for unserviceable components.

(6) *Repair.* To restore to a serviceable condition by replacing unserviceable parts or by any other action required utilizing tools, equipment, and skills available, to include welding, grinding, riveting, straightening, adjusting, etc.

(7) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(8) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or components of a weapons system.

(9) *Rebuild.* To restore to a condition comparable to new by disassembling the item to determine the condition of each of its component parts and reassembling it using serviceable, rebuilt, or new assemblies, sub-assemblies, and parts.

c. 1st, 2d, 3d, 4th, 5th Echelon. The symbol "X" indicates the echelon responsible for performing that particular operation, but does not indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by "X" are authorized to perform the indicated operation.

d. Tools required. The numbers in this column indicate tool, test, and maintenance equipments required to perform maintenance on the equipment. These numbers are identified in the Allocation of Tools for Maintenance Functions.

e. Remarks. This column contains any notations necessary to clarify the data cited in the preceding columns.

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST	SECOND ECHELON		THIRD	FOURTH	FIFTH		
		ECHELON	TACTICAL	FIXED	ECHELON	ECHELON	ECHELON		
GLIDE SLOPE RECEIVER R-746/AR									
	replace				X			1,6	
	repair				X			1,4,6	
	rebuild						X	1,2,3,5,6	
	service				X			1,4,6	
	adjust				X			1,1,6	
	inspect	X							
	test				X			1,6	
	align					X		1,1,6	
	calibrate						X	1,2,3,5,6	
CABLE	replace				X			6	
	repair				X			6	
CAPACITOR	replace				X			6	
COIL ASSEMBLY	replace				X			6	
CONNECTORS, CABLE	replace				X			6	
CRYSTAL	replace				X				
COVER	replace				X				
FASTENER	replace				X			6	
GASKET	replace				X				
GUIDE	replace				X			6	
FILTER, REACTOR	replace				X			6	
INDICATOR	replace				X				
INSULATOR	replace				X			6	
JACK, TELEPHONE	replace				X			6	
LIGHT, PILOT	replace				X				
RECTIFIER, VARISTOR: germanium	replace				X			6	
RELAY	replace				X			6	
RESISTOR, FIXED	replace				X			6	
RESISTOR, VARIABLE	replace				X			6	
SHIELD, TUBE	replace				X				
STUD	replace				X			6	
TERMINAL, BOARD	replace				X			6	
TRANSFORMERS, POWER	replace				X			6	
TRANSFORMER, INTERMEDIATE FREQUENCY	replace				X			6	
TRANSFORMER, RADIO FREQUENCY	replace				X			6	
TUBE	replace				X			6	
	test				X			4	

PART OR COMPONENT	RELATED OPERATION	ECHELON ALLOCATED THE MAINTENANCE OPERATION						REPAIR FACILITIES CODE	
		OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
		FIRST ECHELON	SECOND ECHELON		THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
			TACTICAL	FIXED					
R-746/AR (continued)									
TUBE, SOCKET	replace				X			6	
TUNER, RADIO FREQUENCY	replace					X		6	
WASHER	replace				X			6	
CONTROL RECEIVER C-2065/AR									
	replace								
	repair								
	rebuild								
	service				X			6	
	adjust				X			1,6	
	inspect	X							
	test				X			1	R-746/AR is needed
	align				X			1,6	
	calibrate						X	1,2,3,6	
CONNECTOR	replace				X			6	
LAMP	replace				X				
RESISTOR, VARIABLE	replace				X			6	
SWITCH	replace				X			6	
MOUNTING MT-1762/AR									
	replace								
	repair								
	rebuild								
	service				X			6	
	adjust				X			6	
	inspect	X							
CONNECTOR, RECEPTACLE	replace				X			6	
FRAME	replace				X			6	
PAD, METAL-FLEX	replace				X			6	

3. Allocation of Tools for Maintenance Functions

Columns are as follows:

a. Tools Required for Maintenance Functions. This column lists the tools and the test and maintenance equipment required to perform the maintenance functions.

b. 1st, 2d, 3d, 4th, and 5th Echelon. A dagger symbol indicates the echelons allocated the facility.

c. Tool code. These are code numbers used to refer to the indicated item.

d. Remarks. This column is used for explanatory notes.

4. Mounting Hardware

Basic entries in the maintenance allocation chart do not include mounting hardware, such as screws, nuts, washers, brackets, clamps, etc.

FACILITIES REQUIRED FOR MAINTENANCE OPERATIONS	ECHELON ALLOCATED THE FACILITY						REPAIR FACILITIES CODE	
	OPERATOR	ORGANIZATIONAL		FIELD		DEPOT		
	FIRST ECHELON	SECOND ECHELON		THIRD ECHELON	FOURTH ECHELON	FIFTH ECHELON		
		TACTICAL	FIXED					
R-746/AR (continued)								
MULTIMETER TS-352/U (to be replaced by Multimeter ME-77/U)				†			1	
SIGNAL GENERATOR AN/GRM-4				†			2	
TEST FIG for MN-100A RECEIVER (to be developed)				†			3	
TEST SET, ELECTRON TUBE TV-7/U				†			4	
TEST SET, ELECTRON TUBE TV-2/U						†	5	
TOOL EQUIPMENT TE-113				†			6	

[AG 413.44 (30 Jan 59)]

By Order of *Wilber M. Brucker*, Secretary of the Army:

MAXWELL D. TAYLOR,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

ASA (2)
CNGB (1)
Tech Stf, DA (1) except CSigO (30)
Tech Stf Bd (1)
USCONARC (5)
USA Arty Bd (1)
USA Armor Bd (1)
USA Inf Bd (1)
USA AD Bd (1)
USA Abn & Elct Bd (1)
USA Avn Bd (1)
USA Armor Bd Test Sec (1)
USA Air Def Bd Test Sec (1)
USA Arctic Test Bd (1)
US ARADCOM (2)
US ARADCOM Rgn (2)
OS Maj Comd (5)
Log Comd (5)
MDW (1)
Armies (5)
Corps (2)
Div (2)
USATC (2)
Svc Colleges (5)
Br Svc Sch (5) except USASCS (25)
GENDEP (2) except Atlanta GENDEP (None)
Sig Sec, GENDEP (10)
Sig Depots (17)
Army Pictorial Cen (2)
Engr Maint Cen (1)
USA Ord Msl Comd (3)
TASSA (15)
Mid-Western Rgn Ofc (TASSA) (1)
USA Sig Pub Agcy (8)
USA Sig Engr Agcy (1)
USA Comm Agcy (2)
USA Sig Eqp Spt Agcy (2)
USA Sig Msl Spt Agcy (13)
WRAMC (1)
AFIP (1)
AMS (1)
Ports of Emb (OS) (2)
Trans Terminal Comd (2)
Army Terminals (2)
OS Sup Agcy (2)
Yuma Test Sta (2)
USA Elct PG (1)
Sig Lab (5)
Sig Fld Maint Shops (3)
Fld Comd, AFSWP (5)
Mil Dist (1)
Sector Comd, USA Corps (Res) (1)
USA Corps (Res) (1)
JBUSMC (2)
Units organized under following TOE's:
11–7 (2)
11–16 (2)
11–57 (2)
11–500 (AA–AE) (2)
11–557 (2)
11–587 (2)
11–592 (2)
11–597 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.
USAR: None.
For explanation of abbreviations used, see AR 320–50.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1959 O—498207